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Fig 1.

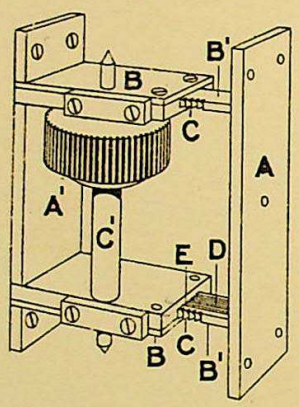


Fig 2.

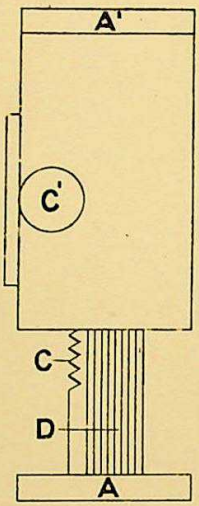


Fig 3.

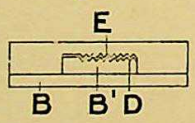
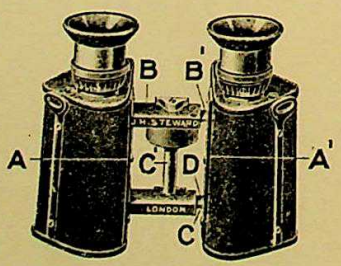


Fig 4.



See (Br) 135,752 85/34 for rack & pinion slide adj of lens carrier

[This Drawing is a reproduction of the Original on a reduced scale.]

Malby&Sons, Photo-Litho.

359/412

88/33

N° 6962 A.D. 1899

Date of Application, 1st Apr., 1899—Accepted, 6th May, 1899

DUPLICATE

COMPLETE SPECIFICATION.

Improvements in Binocular Field Glasses and Telescopes.

JAMES HENRY STEWARD, 406, Strand, London, Optician, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement.—

Where it is a necessity to move two optical systems so as to agree with the inter-ocular distance it has hitherto been difficult to retain extreme truth during the movement, whether the motion is by hinge, or plates sliding one in the other, or by a racked bar moved in a box by a pinion.

In my improvement instead of taking plane bars I have the faces that are in contact grooved lengthwise, or serrated, so that the hollows of one agree with the raised part of the other, and so closely do they fit that there is no shake or lateral play on being moved by any of the usual mechanical motions, such as rack and pinion, endless screw, or by simple sliding. A reference to the accompanying drawings will make this improvement understood.

Fig. 1 is a perspective view of the motion work for adjusting the distance between the two optical systems with the improvement fitted. The side uprights A, A^1 represent the supports which are attached to the bodies of a field glass, double telescope, or prism binocular, and to which are connected two or more bars such as B, B^1 and which are of a size to fit in or on one another so as to allow the bodies of the binocular to be separated. The sliding part of the bars is shown in drawing Figs. 1 and 3 at B^1 and is controlled by rack C & pinion C^1, the grooved or serrated surfaces are shown at D and E, the former fitting into the latter.

In order to illustrate this more clearly I show the same part enlarged and in horizontal section in Fig. 2, and in vertical section in Fig. 3, with the same reference letters.

The form of these grooves or serrations may be wedge shape in section, or U, square, pyramidical, elliptical or partly spherical but preferably I use a V shaped section.

By this arrangement the liability of the two optical systems getting out of truth, or collimation as it is called, is reduced to the minimum and therefore the improvement is particularly useful in binocular glasses fitted with prisms on the Porro principle where the image produced is made erect by several reflections in the prisms. Any deviation of the optical ray from the true path being fatal to the superposition of the images and consequently binocular vision is not obtained. I illustrate in Fig. 4 a prism binocular with my improvement for the adjustment of the bars to the width required fitted to same, and duly lettered to correspond with the perspective and detailed view.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The application of a grooved or serrated surface, to the bars of binocular field

[*Price* 8*d*.]

glasses and telescopes to secure steadiness and freedom from shake or lateral play, substantially as figured and described.

2. An improved binocular field glass having adjustment for inter-ocular distance by means of bars having grooved or serrated surfaces for the purpose set forth and substantially as figured and described.

3. A binocular or double telescope fitted with adjustable grooved or serrated bars for obtaining the necessary width substantially as figured and described in respect to such adjustment or movement.

4. A prism binocular field and marine glass fitted with the Porro system of prisms and having adjustable bars with grooved or serrated surfaces substantially as illustrated by figures, and described.

Dated this 30th day of March 1899.

JAMES HENRY STEWARD.

Redhill: Printed for Her Majesty's Stationery Office, by Malcomson & Co., Ltd.—1899.